

Appl. No: 10/822,573  
Dated: March 1, 2006  
Reply to Office Action of: December 2, 2005

## **REMARKS**

### **Present Status of Application**

The Applicant would like to thank the Examiner for the courteous interview on February 9, 2006 regarding the above cited patent application. Applicant also thanks the Examiner for the Interview Summary dated February 14, 2006. As noted, Applicant is to submit evidence to show that Kuennen et al. does not suggest the recited filtration grain size distribution. No agreements were reached and no commitments were made.

Upon entry of the amendments in this Response, Claims 1-35 remain pending in the application. Claims 1, 6-9, 23 and 28-31 are amended. It is believed that the foregoing Amendments add no new matter to the present application and are made to place the claims in condition for allowance.

Applicants have amended the claims to more specifically point out the invention. Accordingly, the "first portion" and "second portion" are the "modes". Independent Claims 1 and 23 now provide that the multiply modal grain size distribution has at least a first mode and a second mode, wherein the first mode includes a first grain size and the second mode includes a second grain size and the grains of the first mode are smaller than the first grain size and the grains of the second mode are larger than the second grain size and between about 1 and 15 vol % of the grains have a grain size in a range between the first grain size and the second grain size. Dependent Claims 6-9 and 28-31 have been amended in view of the independent claims. The amendment is supported in the application as filed. See, for example, Figure 2A and paragraph [0027].

In view of the foregoing Amendments and following Remarks, applicants respectfully request reconsideration of the present application, with pending Claims 1-35.

### **Claim Rejections under 35 U.S.C. §103(a)**

Claims 1-35 remain rejected under 35 U.S.C. §103(a) as being unpatentable over Kuennen et al (US Patent No. 6,368,504) in view of one skilled in the art.

On page 3 of the outstanding final office action, the Examiner provides that "it is not clear what Applicant intends by the term 'more than one mode'". The Examiner also provides

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that "in any event, the reference filter is inherently capable of being employed to treat water at different flow rates (modes?), and this capability is all that appears to be required by this term."

Applicants respectfully submit that the Examiner has misunderstood the claimed limitations in the present invention. In support of the pending claims, and in response to the telephonic interview on February 9, 2006, Applicants submit herewith the executed Declaration of Dr. Edward Rinker under 37 C.F.R. 132. In his Declaration, Dr. Rinker describes what a "mode" is, particle size reduction processes known in the art and graphical representations of particle size distributions used by those skilled in the art to interpret particle size reductions. Additionally, Dr. Rinker carefully describes the criticality of the claimed limitation of a multiply modal grain size distribution and its inventive step.

In view of the Rinker Declaration, Applicants believe that the claims of the present application will be found allowable. Additionally, Applicants present further argumentation regarding patentability of the claims.

The Examiner alleges that Kuennen et al. discloses "a water treatment system comprising filtration media having particles with a variety of different grain sizes; and further teaches that smaller filtration material particles provide improved filtration but lower flow rates, while larger filtration material particles provide improved flow rates but lesser filtration capability". (See page 2 of the outstanding final office action.) The Examiner further alleges that "this reference discloses the claimed invention with the exception of the relative volume percentage of each filtration material component". Finally, the Examiner concludes that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a filtration material having the recited particle size distribution in the system Kuennen et al., in order to obtain a corresponding balance between filtration capability and flow rate in this reference system." Applicants respectfully disagree for the following reasons.

The initial burden to make a prima facie case of obviousness is on the Examiner. Accordingly, "[t]o support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972,973 (Bd. Pat. App. & Inter.1985). Absent some suggestion or incentive,

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the teachings of references may not be combined. *ACS, supra*, 221 U.S.P.Q. 933, *In re Rinehart*, 531 F.2d 1048, 189 U.S.P.Q. 143 (C.C.P.A. 1976).

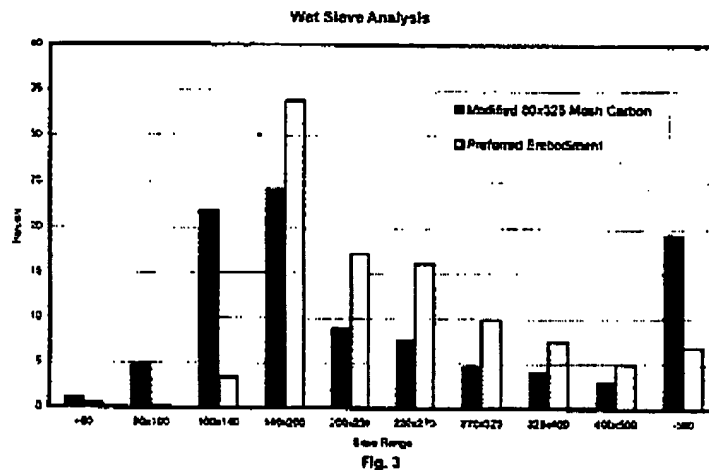
Applicants respectfully submit that the Office's burden has not been met, because there is no objective reason why one skilled in the art, in view of Kuennen, would be motivated to prepare a water treatment device according to the claims of the present application.

The Examiner has not provided a convincing line of reasoning. The fact that Kuennen appears to teach an activated carbon block filter including a particle size distribution weight percentage does not provide motivation to one skilled in the art to prepare the water treatment device of the present application. The Federal Circuit has repeatedly warned that the requisite motivation to combine references must come from the prior art, not Applicants' specification. *See In re Dow Chem. Co. v. American Cyanamid Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531-32 (Fed. Cir. 1988).

It is well known in the art that smaller particles provide improved filtration but lower flow rates, while larger particles provide improved flow rates but lesser filtration capability. It is also well known in the art that particle size reduction accomplished by a single grinding process results in a Gaussian type distribution (ie. a typical bell shaped curve).

As best understood, Kuennen describes "a carbon block that provides reduced mean particle diameter and hence enhanced filtering performance over time", wherein the critical range is less than 10% larger than 140 mesh (104 micron) and less than 10% smaller than 500 mesh (25 micron). (See col. 2, lines 20-21; and col. 2, line 36-38.) One embodiment of Kuennen's invention is depicted in Figure 3 of the '504 patent. For the Examiner's reference, Fig. 3 is presented below. For the examiner's clarification, the mode of the histogram shown in Fig. 3 is at 140x200.

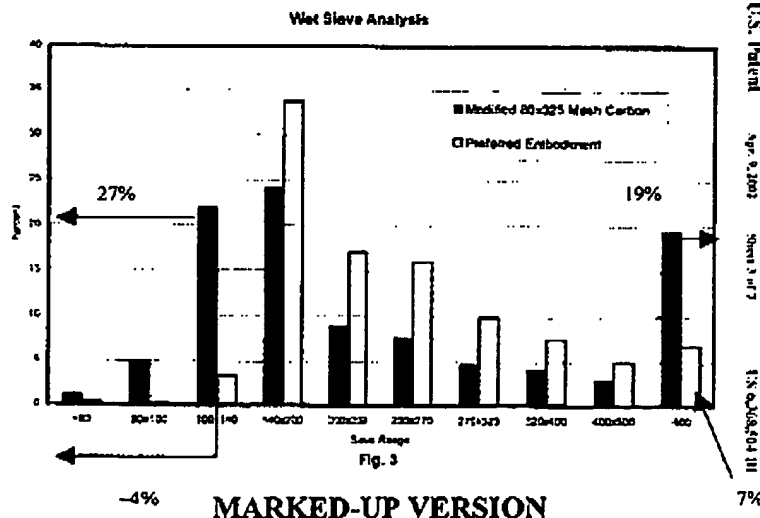
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More preferred embodiments of Kuennen's invention are presented in Figure 7 of '504.

Kuennen describes the particle size distribution based on the volume percentage of the outer (ie. minimum and maximum) ranges; less than 10% larger than 140 mesh and less than 10% smaller than 500 mesh. Kuennen does not contemplate optimal performance of the filter wherein 1-15 vol % is a grain size in a range between a first grain size and a second grain size. In fact, Kuennen provides enablement for 89% of the portion of the particles with a grain size between 140 and 500 mesh. For example, see Fig. 3, the preferred embodiment. Presented below is a marked up version of Fig. 3 from '504 to clearly show the Examiner the grain size distribution vol %'s according to Kuennen.



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Similarly, Figure 7 of '504 shows 8% larger than 140 mesh and 8% smaller than 500 mesh, which leaves 84% vol % for the particles therebetween. Kuennen provides no teaching or motivation for a portion containing intermediately sized particles that constitute between 1 and 15 vol % of the particles. Applicants refer to and reincorporate by reference the arguments made in the Response filed June 15, 2005.

Additionally, the references do not expressly or impliedly suggest the claimed invention. Applicants' believe that the Gaussian type distributions presented in Figures 2, 3 and 7 of '504 support the fact that Kuennen is using a single grinding process, which would only produce one mode when graphically represented. As stated in the Rinker Declaration attached hereto, "[a]ll grinding operations yield unimodal distributions as long as the feed material is composed on a single type of material (e.g. activated carbon)." (See paragraph 8 of the Rinker Declaration.) In comparison, Applicants' mixed two separate materials with modes separated by more than 10 microns and between 1 and 15 vol% of particles between the modes. This resulted in carbon blocks with improved flow rates and did not clog as easily as standard carbon blocks manufactured with unimodally distributed carbon (i.e. 80x325 mesh). See for example, Examples 1, 2 and 3 of the present application. Accordingly, Example 3 provides that 32 vol % activated carbon (80x325) and 24 vol% activated carbon (-325) mesh are mixed together. With an initial SCT of 1.92 seconds, the block was able to remove at least 99,95% of the particles before the SCT increased to above 6.2 seconds.

Kuennen describes the prior art in col. 1, line 47 to col. 2, line 11. In col. 1, line 65 to col. 2, line 6, Kuennen provides, "the carbon normally ground to form typical 80x325 mesh is subjected to a special grinding process that increases the level of carbon particles smaller than 325 mesh. Although the grinding operation inherently results in some variation, this *modified* carbon mixture generally provides a mean particle size of approximately 75 microns and a particle size distribution with approximately 25% or more of the carbon particles being larger than 140 mesh and 25% or more of the carbon particles being smaller than 500 mesh." (*emphasis added*.) It appears to Applicant that the prior art described herewith is also depicted in Figure 3 presented above as the "Modified 80x325 Mesh Carbon". Again, the particle size distribution is described by outer (ie. maximum and minimum) ranges of volume percentages. Enablement is provided for 54% of the portion of the particles with a grain size between 140 and 500 mesh (see

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the marked up Fig. 3 above, modified embodiment, for graphical representation). Kuennen provides no teaching or motivation for a bimodal distribution with a portion containing intermediately sized particles that constitute between 1 and 15 vol % of the particles. Applicants would like to bring the Examiner's attention to the fact that enablement for the *modified* 80x325 mesh carbon shown in Figure 3 is for 27% of the grain sizes larger than 140 mesh and 19% smaller than 500 mesh. The description of the prior art includes 25% or more smaller than 500 mesh. Applicant believes that there is clearly erroneous support for the description of the prior art. Thus, the alleged "modified" prior art block described by Kuennen is clearly not enabling and would not anticipate Applicants' invention.

Without being bound by theory, Applicants restate that the grain size distribution volume percentages described in Kuennen furthermore do not anticipate Applicants' invention, because the distributions described in Kuennen are monomodal systems. Applicants' grain size distribution is based on a multiply modal system, namely bimodal.

Please refer to the attached Declaration by Dr. Rinker for a complete discussion.

In conclusion, the Examiner has not presented a convincing line of reasoning as to why the skilled artisan would have found the claimed invention to have been obvious in light of the teachings of Kuennen. Because the art does not, either individually or taken as a whole, teach, disclose or suggest a multimodal system or the critical intermediate particle sizes range, then an attempt to find such without adequate evidence, should be construed as a hindsight attempt at reconstructing Applicants' invention. This, of course, is expressly proscribed under the patent laws. *See, Gillette Co. v. S.C. Johnson & Son, Inc., 16 U.S.P.Q. 2d 1923 (Fed. Cir. 1990).*

The fact that a critical range can be somehow "inferred" is not the applicable law in posing an alleged prima facie obviousness action.

Lastly, Applicants respectfully submit that Claims 14-22, which relate to a water treatment device comprising a first, second and third portion, wherein a first portion of the grains has grain sizes between 100 and 200  $\mu\text{m}$ , and makes up between about 10 and 50 vol % of the volume, a second portion of the grains has grain sizes between about 1 and 70  $\mu\text{m}$ , and makes up between about 10 and 50 vol % of the volume, and a third portion of the grains has grain sizes between the largest of the first portion and the smallest of the second portion and makes up between about 1 and 15 vol % of the volume are novel in view of the prior art. Applicants refer

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to and reincorporate by reference the arguments made in the Response filed June 15, 2005.

Applicants expressly do not acquiesce in the Examiner's findings not addressed herein. Indeed, Applicants submit that the dependent claims recite further distinguishing and non-obvious features of particular utility.

**Claim Rejections under 35 U.S.C. §112, second paragraph**

Claims 1-13 and 23-35 are rejected under 35 U.S.C. 112, second paragraph "as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention." (Page 2 of the final office action.) The Examiner believes that the term "'having a multiply modal grain size distribution that has at least a first mode and a second mode' (claim 1, lines 2-3; and claim 23, lines 5-6) is vague, and indefinite as to the limitation intended." In view of the claim amendments submitted herewith and the Declaration of Dr. E. Rinker, Applicant believes that said rejection has been overcome.

**CONCLUSIONS**

The rejections under 35 U.S.C. §103 are overcome because the claimed invention is not obvious in view of the prior art, as explained in the attached Declaration by Dr. E. Rinker. Additionally, the Examiner has not presented a convincing line of reasoning as to why a person skilled in the art would have found the claimed invention to be obvious in view of the cited references and the references do not expressly or impliedly suggest the claimed invention.

In view of the foregoing amendments and remarks, Applicant respectfully submits that the application is in condition for allowance. If it is believed that a telephone conversation would expedite the prosecution of the present application, or clarify matters with regard to its allowance, the Examiner is invited to call the undersigned at (925) 425-6905.

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Respectfully submitted,

Dated: March 1, 2006

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